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Introduction to Jeremy Weber and His Background

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Tom: My guest today is Jeremy Weber,

Jeremy: I'm a professor at the Graduate School of Public and International Affairs at the University of Pittsburgh. I'm an economist by training, um, but have been in a policy school now, uh, since 2014.

Um, prior to that, worked for the Department of Agriculture, and also during that time, spent some time at the White House Council of Economic Advisors. Uh, and, uh, just, uh, love the topic of, of public policy and economics and statistics and, and energy and environmental issues especially.

Tom: All right, I'm looking forward to this and you have a short presentation to start, right?

Jeremy: That's right.

Tom: All right, let's do it.

Jeremy: All right, great.

The Big Picture: Statistics for Public Policy

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Jeremy: Well, I'm just going to hit on several what I'd call big picture ideas drawn from a recent book of mine called Statistics for Public Policy. A practical guide to being mostly right or at least [00:01:00] respectably wrong. Uh, so let's dive in.

Understanding Data's Role in Policy Making

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Jeremy: I'm just going to do, again, just a few, few high level ideas about how we should think about data and, uh, their role in policy.

But then, and then also a few words on magnitude, the issue of magnitude. How do we know when a number's large or small? Alarming. Uh, which I think is an underappreciated skill and also an under-taught skill. Uh, can't we just let the data speak? Uh, it's quite

fashionable to speak of science-based policy or data-driven decisions or evidence-based policy, and that that makes sense.

Um, those calls are clearly have their, their justification and their need. We. Don't want to make policy decisions based off of just a gut instinct, uh, but on observation. But those [00:02:00] phrases give the notion that there's a fairly straight line between observation and action, or what you would want to do.

And I would push back on that notion and say that, uh, it's actually quite rare that there's a straight, short line from the data to a decision. Thanks again. And by assuming that there is, uh, we, we mislead ourselves and we're thinking. Uh, we're not thinking right about the nature of observation, the nature of data and what it can and cannot give us.

And I'd argue that statistics can't tell us what policy to adopt any more than a map can tell us where to go.

#### The Map Analogy: Navigating Data and Policy

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Jeremy: Let me use this map analogy to really drive home, uh, the common way that I think statistics are or should be used. So, when we [00:03:00] bring up a map app, we're providing a destination to the app. The app doesn't select destinations for us.

Rather, we give it the destination, and then the map app, like Google Maps here, it gives us, uh, really a wealth of information. But it just gives us information about, for example, the travel time from, uh, you're done from where you are to where you might want to go. It'll give us various routes. They can give you total time, total amounts.

It can tell you, as in the case of Google Maps, it'll, it'll show if you're running into congestion. Uh, I think it also ranks the roads based on, uh, how direct or how straight the roads are. So it's giving all sorts of information. Regarding different routes and but yet it's not telling [00:04:00] you how should you trade off the shorter route or the more direct route with costs like tolls, like the most direct and fastest route might be the highest most costly route in terms of tolls.

And so implicitly the trade off there is, hmm, am I willing to drive a half an hour longer, but save, you know, 30 in toll or something like that. And the map doesn't tell me if I should be trading off time and money at a certain rate. Um, it doesn't tell me how to trade off congestion or straightness of the road versus other attributes.

Um, maps, I love the map analogy because, You could say that maps are both descriptive and subjective. They're descriptive in the sense that, yeah, this Google [00:05:00] Map app, it is telling me what is the distance from where I am to this particular destination if I take this particular route. That's a purely descriptive, uh, exercise or information.

No subjectivity, it's just a measurement. But then, if we also think about, well, what's on this map? Why is it oriented the way it is? There's clearly subjective decisions that have gone into filtering out certain things, bringing to light or making more salient other things. And that's just, that's the subjective component to map making.

I think generally speaking, we should see statistics as making a map that is providing a description of the lay of the land, the implications of various choices, routes, and their consequences. But we're misleading ourselves if we think that the map [00:06:00] is generally going to resolve discussions or conflicts over where we should go.

Um, and I think that's what the. Data driven decisions seems to imply that if I just give the group, let's say the decision making body, the map, Uh, well, discussion should be short and sweet. Once we've got the good map, it'll be obvious where we should go. And if you've ever been on a family vacation, uh, you know, man, the map, that's where the discussion gets started.

Uh, but you got some folks wanting to go to the beach. You got some folks wanting to go to the theme park. Others that want to go for a hike. And the map, yes, it aids in, in the discussion, but it's by no means resolving the differences over, uh, preferences over where we want to go. [00:07:00] Um, I want to share a quote here just to highlight that map making is very different than destination selecting.

Those are two different exercises. It's one thing to make that good map that accurately measures the difference distances between various routes. It is a different thing to take that map into the into the body where the decision making body and then start arguing for a particular destination in a particular route.

## Real-world Policy Implications and Challenges

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Jeremy: And the analogy here is pointing to just measuring things in the world around us through statistics, um, is very different than actually deciding about or even discussing what policy the country, the The city should adopt, and I love [00:08:00] this quote by an economist, um, Jean Drozet, uh, from a blog post of his, he does a lot

of work in India, and, and he has this great quote that highlights just how messy things can get when you take, when you go from analysis or statistics into policy, and he's giving the example of a randomized controlled trial of whether eggs are Added an egg added to, uh, to school lunches improves student performance.

And here's what he says. He says no value judgments are required to conduct a randomized control trial aimed at examining whether adding eggs in school meals helps to enhance pupil attendance or child nutrition. But advocating the inclusion of eggs in school meals is a very different ballgame. It means dealing with the arguments of upper caste vegetarian lobbies and animal rights [00:09:00] activists, aside from those of the finance ministry, the education department, and teachers unions.

Commercial interests, too, are likely to come into play as the poultry business eyes big contracts. Any advice offered in this charged atmosphere may have serious repercussions, good or bad. A worse case, but not uncommon, scenario is that a piece of evidence turns out to be counterproductive. Dealing with these choices, conflicts, and dilemmas requires much more than evidence.

I love that because it just highlights the complexity. From, uh, in, in the decision making realm, where, where, um, real resources are going to be allocated, and that being quite, quite a different, quite a messier realm than just measuring, well, how did these students perform after they got an egg, uh, and that highlights or leads me to some other ideas that I want to drive home here, and that [00:10:00] is that statistics in policy can, can really range from being Decisive, that does happen, I think, to irrelevant.

Um, they can be decisive, kind of like with a, with a, a map. Um, if, if, if everybody is on the same page in the car about wanting to go to the beach. Then the map is going to be just what the map tells you about. The route is going to be decisive. It's probably or nearly decisive. You typically want to go to the shortest route.

Um, and the map is going to tell you what is the shortest route to that already agreed upon destination. But more often than not, the map is just going to be informative. It's going to help you quantify the tradeoffs. It's going to tell us, hmm, if we went to this destination, it would be longer, but maybe better destination, and this other destination, shorter, but maybe not as attractive, and how should we weigh that [00:11:00] off?

It might, statistics can help us to quantify that trade off, kind of like the map gave us, uh, gives us trade off between time and money, between travel distance, or travel time and tolls. And then lastly, sometimes statistics are just plain down irrelevant. Uh, there might be a higher order conviction, uh, which is why we wouldn't do a

particular policy, even though in some country it may be shown to be effective in, in, uh, reducing some, some bad outcome.

But we're, we're not going to even entertain the results of that study. If, if it was. Um, a study that say, you know, forced people to be sterilized or something like that. Uh, we would just say that's a non starter even if that policy worked very well. So those are some big ideas around the role that statistics can play in policy.

## Magnitude Matters: Interpreting Statistical Significance

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Jeremy: And I want to shift to talking about magnitude, the magnitude of a statistic. Um, and in my book, I [00:12:00] argue that the policy aid, which is the person I have in mind, somebody who's using their statistical savvy, to aid a decision maker. They're not just a data lackey, they're, um, they're doing principled independent thinking, helping this decision maker, uh, better understand an issue.

And I argue that the policy aid is, to serve the decision maker well, really needs to help, uh, the decision maker understand the magnitude of numbers. Instead of just reporting measurements, is the number large? Is it small? And think of this example that I use in the book, where you take your car into an auto shop, and you're worried that you might need to get new tires, that your tires are running low on tread, you're worried about running off the road, worried about them maybe, Having a blowout and you asked her, uh, to the expert whether or not the tires [00:13:00] need to be changed and the expert says, uh, he measures the tire tread and he says, you've got six millimeters of tread left and he looks at you as if he answered your question.

Uh, but, but he hasn't really, he's just giving you a measurement and I'd ask you. Whoa. Imagine that this person had just told you, you've got six millimeters of tread left. What's going to help convert that measurement into an answer to your question, which is, should I get new tires? And you might think of things like, well, how much did the tire, how much tire tread did I start with?

Was it eight millimeters and now I'm at six or was it 18 millimeters and now I'm down to six? At what tire tread do most people change their tires or at what tread tread? Does the risk of sliding off the road jump considerably, or maybe even, maybe there's a [00:14:00] legal minimum tread that a vehicle needs, that a tire needs to have, uh, to be used on a vehicle.

This is contextual information that aids the decision maker, the car owner in this case, aids the decision maker in understanding whether that six millimeters is a large or a small number. Without this contextual information. It's really hard to know what to do with fixed

millimeter, uh, but this is really hard work.

This is not easy, um, and I use this example in the book, and I'll just highlight it briefly now. Imagine that one in 1, 000 natural gas wells results in methane migrating into nearby groundwater. That's a 1 percent leak rate, 0. 1 percent leak rate. Is that a high leak rate? Would you hear that and think, Oh my word, it's [00:15:00] 0.

1%. Or would you hear it and say, only 0. 1%? Only one in a thousand? It's not obvious how we should think about that number. And our political, uh, or risk preferences, our ideological commitments is probably going to skew us into just default thinking of it as either high or low. But I'd argue that just a lot of work needs to be done to understand whether that 0.

1 percent is right. Migration rate is a high number. Um, and here are a few things that might help answer that question. What are the health consequences? Of that methane entering the groundwater are people dying or is this have very little to no health consequences? Is migration easy to address? For example, if we is there a quick fix on the at the wellhead?

Um, [00:16:00] and then the methane that did migrate out that dissipates in the environment by itself, or does it require extensive environmental immediate remediation? All right, that would matter. Are our migration cases reflected of one bad actor company? So we've got this one in 1, 000. Is that like an intrinsic risk to drilling natural gas wells, or, that you just can't avoid, or are all of those faulty wells, uh, the, the wells of one bad actor company?

And so the vast majority of companies are actually able to drill wells with 100 percent success rate, uh, zero leak rate, Um, and then lastly here, what are kind of leak rates of comparable industries or similar situations? Maybe, maybe we think of hog manure pits. How frequently do they have a leak and contaminate the environment?

Those [00:17:00] questions help to put into perspective that 0. 1 percent migration rate, whether we should be alarmed or That it's so high or, uh, whether it should be considered ignorable. Now, this is very controversial. Putting adjectives next to numbers, getting people to think about whether they're large or small is controversial.

Uh, an example I use in the book is EPA's draft, the Environmental Protection Agency, in, um, I believe it was 2016, After years of work, released a draft report around hydraulic fracturing and groundwater resources, and it's, um, draft report conclusion, what involved this statement, we did not find evidence that fracking related activities have led to widespread systematic impacts on drinking water resources.

The number of identified cases where drinking [00:18:00] water

resources were impacted. Are small relative to the number of hydraulically fractured wells. Well, that conclusion got major blowback from environmental groups who, um, living wanted to litigate the word small or systematic and say, Hey, you know, those aren't the right adjectives.

And then a revised report. Revisions were done, a revised report was released, and that revised report doesn't have any adjectives in its 50 page executive summary. No adjectives like they're doing here to describe the effects. It simply says, cases of impact were identified. It doesn't even give you, in the 50 page executive summary, it doesn't give you the number, Of instances of groundwater contamination or the number of wells drilled.

It doesn't provide anything that would allow you to have some sense of [00:19:00] magnitude. 70, 000 wells have been drilled. And all you're telling me is that cases of impact were identified. All right. That I have no idea. Is it 1 in 70, 000? Is it 5 in 70, 000? Is it something much larger? Um, to avoid controversy, the EPA simply cleansed, cleansed the executive summary from anything that would aid the reader in gaining a sense of magnitude.

Uh, but this is really important. And I'm going to come now with a climate example. Uh, this is from a recent study that was released in Nature Climate Change, and it's looking at the damages done, the projected damages. Uh, economic damages from a rise in, in global temperatures. Um, and this is their conclusion.

We examined the [00:20:00] impact of climate change on global GDP. At 3 percent Celsius, that is a 3 percent Celsius rise above pre industrial level, global GDP decreases by 10%. For context, A 10 percent reduction exceeds the GDP loss of the COVID 19 pandemic when global growth plummeted from positive 2. 6 percent to negative 3.

1 percent in 2020, or the effect of the global financial crisis in 2009 when global output shrunk by negative 1. 3%. Um, now I love and I commend the authors here for attempting. To, uh, help the reader gauge the magnitude of their projection. All right. Help me think about the 10 percent that you found and the authors are making attempt here.

They're trying to provide context to go back to the [00:21:00] tire example. They're trying to give them that ancillary information instead of just reporting 60 millimeters of thread left, but there's good and bad ways of providing contextual information. And I think this could be improved upon. So the COVID 19 pandemic And the global financial crisis in 2008 and 9, uh, those were acute shocks.

Those happened in a matter of, uh, over the course of a year or so. Um, the GDP loss that these authors are projecting is occurring over more than 40 years. And so what, what they're doing is actually not

helping us. I think, have a good understanding of, a better understanding of their 10%. They're making us think of that 10 percent as if it were immediate cut to my wage, right?

So it's just to use an example of a [00:22:00] labor and their wage. What they've estimated is more like my wages are growing more slowly over year over time. And over 40 years, I will have less income. My income level 40 or 50 years from now will be less. Then had that, those wages not risen as much. Right. That's really what's, what the authors are projecting over this, over into the 2060s and 2070s.

By then, GDP will be this much lower than it would have otherwise been. Right. So the, the, the analogy that they're, the comparison they're drawing here is actually not what they're studying. It's, they're not studying a 10% shock to GDP. In 2021, or even in 2060, it happens gradually over time. And so here is an [00:23:00] example where it's, it's, it's, um, really important to be providing readers engaging in an argument about adjectives.

And again, this is a discussion. It's not a, it's not an exact science. Um, and the point isn't just flapping adjectives on your findings. Thank you. Rather, it's coming up with the reasons, the arguments for why we should think of a number in a certain way as large or small. The authors here are clearly wanting the, uh, reader to, well, I shouldn't say clearly.

With the example they gave, I want the reader to think of this as being a much bigger deal than the COVID global GDP shock or the global financial crisis shock. And we have in our minds what was going on at those times. Um, and, and my argument would be, well, that's, that's really not what, what you're studying.

Uh, and so I think other contextual information, [00:24:00] kind of like maybe this, uh, wage example where you're slowly, your income's rising more slowly over time, better helps to gauge, hmm, uh, the magnitude of the, of the finding. And I'll, I'll stop there. There's obviously a lot that could be said. About all of all of these, uh, topics, uh, and I'm excited to have a conversation about it.

## Debating Climate Change Projections and Policy

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Tom: Okay, I wanted to comment on that 10 percent estimate. I would take a step back on that. As far as I'm concerned, I would say that maybe the odds are just as good that we would get a 10 percent gain in GDP because of warming. There's an assumption there that warmth is bad and humans do worse in warm weather.



And all of our history suggests that we do better in warm weather or during warm periods, we've done better. Do you have any thoughts on that?

Jeremy: Well, my first thought is that, um, in policy settings, [00:25:00] Uh, we're often sometimes just want to know, is, is, is something more likely to work than not? Is, is an odds more likely, uh, you know, for this event to happen than not?

In academic settings, we're often, we're often looking for a level of certainty. That's just not practical in real world settings. So I didn't go into the uncertainty parameters around this, but I do think one idea and it's strong for my book is that, uh, we can't expect, um, we shouldn't blindly adopt.

Academic standards for uncertainty into the policy setting. I mean, we don't do that in our own lives. There are some things for which even a small probability of that bad thing happening is enough to get us to buy insurance. There's other instances where we're fine with, Oh, is it more likely than not to work out?

And so you're absolutely right. That there's uncertainty surrounded these projections. There's. A lot of, [00:26:00] of information that's going into the model and, you know, if those were different, might we have not just a different magnitude, but a different sign that's fair. I'm not a climate scientist. I didn't dive into the this modeling, but my point was just to say.

Uh, whatever the number you have, um, we should think hard about, should we be concerned about that number, uh, or, or should we be not? Obviously, if there's a whole nother debate over whether the number itself is right. And I make a point in the book that, for example, statistical significance, which is a common measure, uh, of uncertainty surrounded a number, is not a substitute for discussing magnitude.

Um, and, and I would say. You know, similarly, um, saying, well, the number could be, uh, your model could be really wrong. Um, and that's true. [00:27:00] That is an important discussion. Is the model right in its first place? We got to dive into that. We might be totally off the sign. Um, but whatever number your best model gives.

How should we think about that number? I think those are two separate exercises, both really important. I think your question goes to the first one, you know, your, your assumptions, whatever went into that model are not properly accounting for overstating something, um, and so you're getting a qualitatively wrong result.

That's obviously, that's a first order issue. I think they're both

first order issues. Like whatever number you give, we need to think about whether we should ignore it or be really concerned. Um, and at the same time, we need to think about, wait, is that, where's that number coming from in the first place?

Tom: I bought your book on Kindle. I took a look at it and you had an interesting anecdote about your garage getting flooded. Do you want to mention that one?

Jeremy: Yeah. Uh, so [00:28:00] this was in the context of the importance of distinguishing, uh, small causes from large causes, main causes from secondary causes, because.

What I see happening is well, oftentimes it's statistics courses when they teach on correlation versus causation. Silly examples are used examples like in summer ice cream sales go up and so do murder rates, but you know, so there's this positive correlation, but we don't really think ice cream sales are causing murder rates and those silly examples.

That capture the attention of students and they drive home the point to a degree, but they make us think that, um, the spurious correlation examples, the spurious correlation cases are these, uh, are, uh, let me say that differently. They [00:29:00] don't alert us to what I think is the most common issue and that is.

Things that are plausibly, causally connected, but are very small in their role. Um, and the example of my drain was, uh, one summer my drain flooded in the back of my house, uh, on, behind my garage. And, and my basement then got water in it, and I was perplexed as to why this had happened. Um, looked like the drain was draining to a degree.

And so the thought, my thought, immediately went to the volume of water, how severe the storm was, and my neighbor suggested, well, you know, this is, this is just what we have to live with, with climate change. Um, and I didn't really question that it was a volume of water issue. I thought, yeah, you know, maybe it's just a more extreme storm and That's why my drain is flooding, and so I went out and [00:30:00] I rented a concrete saw and I cut up half of the asphalt area that was draining into that drain.

Um, dug it down to the permeable layer so that that water would no longer be running through the drain. Well, it was maybe it was a short time later, maybe a week or two. We had another storm and it flooded again. And that made me think more deeply about the nature of my problem. If the area drained. Had just been cut in half and I was still having flooding, then that would have had to mean that that's most recent storm was like twice as severe as any storm I've ever had in the past as many years that I've been living there.

And I thought, well, that that's really unlikely. There's got to be something else going on. And my neighbor happened to have a plumber over. The next day or shortly thereafter to look at something and I had him come and just look at the drain and his [00:31:00] knowledge of how those types of drains work. Um, let him to say, Hey, there should be that pipe actually cuts back towards your house and inside your garage.

There should be a way to access a king point. And we go there, open it up and that kink is just clogged with Um, I pulled it out and I've never had an issue, uh, with that drain flooding since then. And what I like about that example is it illustrates, well, the water was causally connected. There's a, there's a clear, um, mechanism or mechanism for volume of rain falling, volume of water hitting my drain and my, um, Problem, which is my garage being flooded, so those are, this is not ice cream and murder.

This is something much more than a reasonable person is going to connect these two. Yeah, your problem is the volume of water. But [00:32:00] digging further, I could have slowed the volume of water hitting my drain to a trickle, and I would not have solved my problem because the drain's capacity had so been reduced.

you The main cause of my flooding problem was my, a clog in my drain. And oftentimes in policy, in political speech, especially, you'll hear a minor cause mixed in with a major cause, or maybe just a minor cause by itself. The example I use in the book is, um, rising oil production in 2019, which the White House wanted to tout as something that linked to its.

Um, deregulation of, of the energy sector, and, and so there was more investment and more production, and we're seeing that, and certainly I think that, that deregulation causally, [00:33:00] there's a, there's a clear, clear link between, um, regulation, cost of production, investment decisions, and then actual production, like that makes sense, but in the language of the White House, it was, Sometimes prices were never even mentioned, and it was just deregulation was basically causing this rise in oil production, when in fact we, we had had, you know, 50 per barrel oil, and we're now at 80, and that large increase in price was most clearly the driver, and it's, it's illustrated by right now, because we have a very different administration with different, uh, regulatory perspective, and we're hitting record So, thanks so much for talking to Oil production as a country.

Um, but we can so easily conflate these very minor causes, uh, with the major drivers of change. And I think that happens in, uh, I, I [00:34:00] see that a fair amount in the language around climate. It'll be, it'll be language like such and such helps or contributes to climate change. Well, you know, you can have the smallest contribution

to climate change and still be contributing.

Just like the deregulation was contributing to rising oil production. But within that word contribute, we can sneak in something that is essentially, nearly zero with something that is the primary driver, all of that kind of gets thrown in the same soup, um, and treated the same with that sort of vague language that's not where the roles of the different factors are not being quantified or, yeah, separated.

Tom: So, are you kind of seeing this everywhere that this whole idea of climate change causes increased forest fires and eating meat causes climate change? So if you eat a [00:35:00] hamburger, uh, if you eat less hamburgers for lunch, then you're going to prevent forest fires. Aren't you kind of seeing this everywhere?

I am.

Jeremy: Yeah, no, I am seeing that everywhere where, you know, of course are exactly and, and it's, it's almost.

You know, and it's not, it's not untrue, like, in, in a, in just a theoretical, like, connect the dots way. Like, yes, rainfall did contribute to the flooding of my drain, but it's, um, it's so, uh, I would argue in some instances, you, you might even just debate on the side, like, does my action actually have that effect because of the complexity of the economy, the way prices work and responses.

Um, but then even if it did have a slightly positive effect. We can [00:36:00] talk about it. It's contributing it and put it right next to, uh, emissions from from from major sources, or it is everywhere. Um, that's that is the short answer. I am seeing that everywhere. And I think it might be. I'm just speculating. But, you know, I've seen some articles about, um, climate anxiety.

And it makes sense that you you get kind of anxious. If you thought that kind of every breath, every step you took was contributing to global climate change, and as if you were, you know, a coal plant yourself, yourself.

Tom: Yeah, not to belabor the point about the sign, but I do see, uh, this thinking that, uh, climate change, the debate is about the magnitude of the problem.

It does make everything worse. Global warming makes every single thing worse. It's just a matter of how much worse does it make it. But then you have to say, would global cooling make every single thing better? Less forest fires, less floods, less, [00:37:00] less droughts, everything. Uh, I, I think that's a good argument, that, uh, if we thought that hydrocarbons were causing global cooling, there's no way that academics would be out there arguing that, yeah, look at this

benefit we're getting from burning fossil fuel because cooling is good and warming is bad.

I think we would get all the arguments in reverse, that cooling is making everything worse.

Jeremy: Right, right, but, but, and you're saying that you don't think that, that, that wouldn't be the narrative that emerges, um, even though that's the narrative that emerges in this direction. Right.

Tom: Right, right.

Jeremy: Yeah. Um, so I think like, you know, these, like the study that I mentioned, they are trying to make this is I think we maybe want to separate, um, kind of popular club coverage of climate issues and and particular academics studies, not to say there aren't misleading academic studies.

I'm sure. They're, they're all over the place. Um, but, you know, I've seen work, for example, on trying to. [00:38:00] Tease out the net effect, say, of higher temperatures on mortality, and there's, there's, um, there's some areas where you get less mortality at higher temperatures, some areas where you, and so they are trying to, with particular outcomes, look at the net effect, um, yeah, your, your, your point, Seth.

Tom: Do you see this in other areas of our lives right now where people are just wildly, uh, there's a look at the way things work is way wrong and statistics prove that it's way wrong. I don't know if in COVID or if, uh, anything else other than climate, are you seeing this?

Jeremy: That's a good question. Um,

I think the, I mean the, the client,

[00:39:00] well, I, you know, I, I will draw an analogy. I, I'm not, I'm less familiar with the research on, um, uh, say the benefits of a diverse work team or a diverse this or that. Um, but I regularly see highlighted research in the popular press. I'm not diving into this literature, you know, that is showing, uh, you know, if there's some positive effect of the diversity of your team on some output that that gets, you know, Uh, you know, if it's, if it's positive, it's in the right direction, it gets elevated and magnified, um, by, by the media.

And, uh, I think that's, you know, what, what I do see, broadly speaking, is that when you have a dominant narrative, whether that be, um, climate change or something else, um, that is in people's minds, it's in the [00:40:00] minds of the media, it's in the minds of the journal editors, Um, there is going to be an appetite, a palate for

studies that find certain things.

Um, even if the effects are not that large, that won't be questioned so much. Um, I'll give you an example, um, from my own work, uh, in, I don't recall the exact year, but a group did a study of the link between, uh, various factors and indoor radon, radon concentrations. Radon is a gas that occurs naturally, comes.

Kind of out of the bedrock, can come out of the bedrock, and this study was looking at factors related to indoor radon concentrations in Pennsylvania, and, uh, it found that the more [00:41:00] wells you had drilled nearby, the greater the indoor radon concentration. It found many other things. But, uh, the day it was released, uh, four national media outlets, uh, Picked up on the studies finding and there were that particular finding and said radon and they were titles like carcinogenic gas linked to drilling and, um, that, that studies finding was, was amplified in many ways.

It was, it was, it was like, I don't know, you just, you know, Well, it's like lighting a match with faint fumes in the air. The air was ripe for then the magnifying of that, that effect. Um, some colleagues of mine looked at the study and, and thought, Ah, I'm not sure this will hold up. We went through a year just to get the data to then do the same similar analysis ourselves.

And when [00:42:00] we, uh, did more robust measures and, and, Um, Pushed on the results a bit. They went away without too much effort. And our conclusion was, you know, whatever health concerns there might be around hydraulic fracturing, the concern that the wells are increasing indoor radon concentrations, that the evidence, the thousands, the thousands and thousands of wells drilled in Pennsylvania and all of our radon measurements, is Do not support that at all.

We had a pretty precisely estimated zero effect. We published this study and nobody cared, right? So, uh, you know, NBC News could have cared less. Now, why is it that the one study of, you know, the, the environment was right to magnify that finding and have it ringing at everybody's ears? Whereas finding that, oh, in fact, that, that is not the case, there [00:43:00] is not a link between fracking and indoor radon concentrations, nobody seemed to want to amplify that.

It did, it did cause me to pause and wonder, wait, what, you know, what's going on here that, that one finding is being magnified and the other isn't. Um, and there, there might be some good reasons to it. I mean, finding of a threat is, is, is. It's arguably more important that this thing, that something's not a threat, maybe.

Um, but I think there's more going on there than just Kind of objective, uh, consideration to the implications of the finding.

## Exploring Other Environmental and Policy Issues

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Tom: Based on the work you've done, uh, how about two other, uh, environmental issues, uh, radiation and mercury? Do you think we have the appropriate level of fear of both of those, or overblown, underblown, or what do you think?

Jeremy: You know, I'm gonna have to punt on that one. That's not, uh, I've not looked at [00:44:00] all into the studies of mercury or irradiation. I mean, I will say I've seen where, um, thresholds can get hardwired into government bureaucracy and be very slow to evolve. Um, sometimes they're not, don't have, uh, as much to go on and, and yet they're, they're treated as a threshold, but I have some sympathy for, you know, regulators, health regulators, your, your, to put on my, my, uh, optimist glasses.

You're doing your best to protect public health. There's various types of areas you can be making at any moment. You have to make a decision because. Any, deciding not to regulate is a policy decision. So you can't say inevitably or you're indefinitely, well, we don't have enough information, so we're not going to do anything.

Well, that is making a decision about how much [00:45:00] information you need before it makes sense to make a decision. Um, so you've got to make decisions with the information you have. I mean, that's, that's just the nature of policymaking. Um, that said, uh, thresholds and certain, uh, bodies of knowledge can get baked into a regulatory system and be very hard to, to change.

Um, I'll give you an example that I do have more information on, and that is the renewable fuel standard. So this was a 2007, 2005, and then ramped up in 2007 mandate that a certain amount of. Biofuel had to be blended into our gasoline. Uh, the production of gasoline sold in the U S market. And since that was justified based on it's going to be good for the climate, it's going to be good for national security, and it's going to be good for rural economies.

And since then, a lot of research has, um, shown environmentally, this is, [00:46:00] this is pretty problematic. Um, in fact, it's probably. Increasing greenhouse gas emissions, uh, rather than decreasing it. And then you have the soil and water quality effects of agricultural intensification, um, in the heartland. So, and then we're already, uh, exporting more, um, uh, oil and natural gas than we produce.

Uh, so we're, we're in, we're energy independent. So the pillars of this, of supporting this policy have really Fallen away over time, and yet it remains. It remains a policy that we put in place to reduce

climate change, for example, um, after it was showed that it doesn't do that. And probably does the opposite.

We still, we keep doing it. That's sort of authentication of a standard. I think is quite [00:47:00] common. Uh, in policy. Um, and so while I've not, I've not read on the mercury, uh, situation, I wouldn't be surprised if there's other examples of policy becoming ossified, uh, despite new information that either the threshold not at the right place, or it's just.

We were, we were completely wrong, even about the sign

Tom: on a different podcast.

### The Role of Experts in Public Discourse

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Tom: I heard someone talking to you about this interesting issue that, uh, people either might, um, defer to experts too much or not enough. They think, oh, they're just eggheads. They don't know anything or they're an expert. They know more than me.

I'm going to do whatever they say. Do you think that's changed at all? The way people are looking at experts over the last four years, because to me, it seems like they are trusting experts less now than four years ago. But what do you think?

Jeremy: Yeah, no, definitely. I would agree with that. I think COVID did a huge, a huge number on the respectability of [00:48:00] experts, and, and I think the origin of that was when you use, when you consider statistics to be decisive for policy, and the, your audience doesn't really agree with you, or a good part of your audience doesn't really agree with you, and you just keep beating them with, um, your so called evidence based policy.

As if it should lead to a certain policy outcome, you're really talking past your audience. Um, you're not hearing your audience. It's, it's as if, what I think was happening was something analogous to, um, me being in the car with my family and saying, and knowing, like, or having in my mind, I want to go to the beach, the beach is the shortest distance, uh, destination, and I keep yelling at my family, it's the shortest distance.

It's the shortest distance and they're saying I, I don't really want to go to the beach or [00:49:00] I'd rather for this. I'd rather go to the park and I'm saying it's the shortest distance. We're talking past each other and they're going to lose respect for me when I'm not hearing what they're saying. And I think what, what was happening with COVID is that there were real, real concerns or questions being raised



about the efficacy of lockdowns, about, uh, about the purpose, about the value of individual rights or basic freedoms being curtailed.

People were raising these issues. And, um, they were being met in some cases with, you know, you, you, you don't care about people, you, you're not looking at the data, you've got your head in the sand, um, and we shouldn't be surprised then that the people who are wielding the evidence and the statistics and making the policy recommendations then lose credibility.

In the eyes of the people who felt like they weren't being heard [00:50:00] at all and they were just being beaten over the head with data,

Tom: so do you personally feel free to say what you really think? Uh looking at the evidence and say here, you know, this is not supporting a narrative But here's what I think anyway, or are you worried about cancellation?

Jeremy: I think it depends on the topic in the forum um I'm i'm quite I'm quite aware of my ability to be wrong. I've been working with data and observing policy for long enough that I, uh, I know that I can be seeing things wrongly. And so, um, I'm not afraid to speak when I feel like I've done my due diligence and I'm looking at this Um, I'm not, I'm not [00:51:00] worried about saying that because at the end of the day, I sleep well if I feel like, you know, I've, I've done the due diligence, but I also, I also know that, um, in arguments, for example, or debates.

I can easily get kind of tunnel vision with a particular argument and not be hearing the critique or dismissing a caricature of it. Um, so I am, what, what will, what gives me pause in, in writing something or saying something is feeling like my own bias is not being properly checked? Because here's, here's what does happen is.

I see certain narratives around me in the university, in the academia, and they're so dominant and pervasive and people aren't questioning them that even if I don't fully disagree with them, I feel like I got to inject [00:52:00] some at least critique in here to get the conversation going. And, uh, and I don't want to do that.

Um, I mean, I feel like it needs to be done, but sometimes I do it. I could do it in a knee jerky way, just because I'm like, Hey, nobody's raising these questions. Let's ask them. That's that's what I that's where I found my find myself a lot is really just Um, almost wanting to, to be a skeptic because like somebody needs, not a skeptic might not be a, a questioner, questioner.

Oh, well, have you thought about it from this angle? Um, because I just don't see it happening, uh, so much.

Tom: Okay, very good. Uh, yeah, I think asking the questions is a great thing if they have the answer is great. If they don't, then what? Um, any other points? Then you've got to do your own

Jeremy: work.

Tom: Yeah. Yeah. It sounds like [00:53:00] you are okay with people who are not experts doing some sanity checking, doing their own research.

It sounds like you're okay with that. Oh,

Jeremy: I am 100 percent okay with that. Um, I think actually, and I've jumped around sub discipline somewhat. I actually think it's quite healthy for people who aren't steeped in a particular, um, sub field, for example, or for an expert to come in and ask basic questions like, wait, why are you talking about it in this way?

Or why are you using these data? Because It's very easy to become kind of acculturated and then you, you take so much, for example, for, for granted, like, why are we doing this a certain way? Why are we using this data? Why are we interpreting it this way? And having somebody come in and generally ask questions so that people have to justify those decisions.

As opposed to just continuing them as if they were, you know, tradition that must be preserved. [00:54:00] Um, I think that's a healthy thing. I think the danger for somebody coming in from outside is, and I've done this, from somebody coming outside of an organization into an organization, or somebody being new to a field or a topic.

It is, it is easy. To come in and and be like, Wait, this doesn't make any sense. Why are they doing it this way and not appreciate all that went into that just because you're not aware of it. Um, so I think everybody's got their, uh, kind of biases that needs to be checked. But fresh eyes are always helpful.

People coming in can can also not appreciate what's already been done. So it's as if different, different parties need to hear different things.

Tom: Very good.

Closing Thoughts and the Importance of Questioning

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Tom: All right, any other points you'd like to make before we wrap

this one up?

Jeremy: This has [00:55:00] been great, uh, raising a lot of issues. We could talk, we could talk a lot more, but, uh, I think we've covered a lot of good ground.

Tom: Very good. All right. Thanks, uh, for doing this. I hope to do this again. Now, Jeremy Weber, talk to you later.

Jeremy: All right. Thanks, Tom.